1-22-2001

County Agent's Notes: Using wood for home heating - January 22, 2001

Ernest "Ernie" Flint Jr.

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Using wood for home heating….

Since receiving last month's gas bill many of you have returned to burning wood, at least as supplemental heat for homes. Wood is plentiful and accessible for many in this area, and if properly used it is relatively clean and comes from a renewable source – the forest. In the early 1900's wood provided for most home heating in the United States. By 1970 wood use had dropped to less than one percent of the nations energy usage, however after the 1973 oil embargo wood reemerged as a source of home heating fuel. By the mid 1980's wood provided about six percent of the nations energy needs. Contrary to common belief, wood burning does not harm the environment since the burning of wood is part of nature.

Supplies of natural gas and propane fuels are limited, expensive, and are not renewable. The heating value of properly prepared firewood compares well with other fuels. When you get fuel wood from the forest through timber-stand improvement, the forest also benefits. During energy shortages, such as we are experiencing now, wood can be an important source of heat.

Wood does have disadvantages for home heating which have contributed to the decline in its use over the years. These include: firewood storage problems, possible chimney fires, and the inefficiency of many methods of burning wood. Another factor is the inherent danger, hard work, equipment, and time required for preparing supplies of firewood.

A pound of wood with 20 percent moisture content has a heat value of about 7,000 British Thermal Units (Btu). Heating qualities vary with the species of wood, primarily

depending on the density of the wood. For example, a cord (4' x 4' x 8') of well-dried red oak contains 25.3 million Btu (MMBtu), however the efficiency of burning greatly influences the amount of usable heat it will produce. When burned in the "average" open fireplace only 10 to 20 percent of the energy contained in the wood is captured. A more efficient wood stove may capture 50 percent or more of the heat.

Applying some arithmetic to this we can see what firewood is really worth in terms if its ability to heat. In the case of the fireplace only about 4 MMBtu of heat are usable from our cord of red oak. Comparing this with natural gas at around $6 per MMBtu which is a fairly current price, the cord of wood will produce only about $24 worth of heat. With the stove we can expect to get about 12 MMBtu from the cord, which will be worth about $72. Some of the more modern stoves can reportedly capture 70 to 80 percent of the energy from wood, producing heat worth $113 from our cord of red oak.

Other species of wood contain differing amounts of available energy. For comparison, hickory has 29.1, ash has 23.6, elm has 21.4, pine has 19, and sweetgum has about 18 MMBtu per cord. The hottest-burning species is osage orange, commonly called "bo-doc" in this area, which contains over 30 MMBtu per cord. The different species have other characteristics like ease of splitting and burning, smoke production, and throwing sparks that also affect their desirability as firewood.

When you purchase firewood, check it to avoid the undesirable softwoods, and don't buy "green" wood since it will not burn well and it can cause creosote buildup. When cutting your own wood, harvest undesirable trees as a way of improving the forest. Removing undesirable species, diseased, insect damaged, crooked, and forked trees will allow desirable timber trees to grow better, adding value to a timber stand.

You can use wood safely in home heating units, but each year many costly and tragic fires occur. This does not have to happen if you use common sense and take a few precautions. Use a properly constructed chimney, and keep it in good repair and free of creosote. Set the unit on an inflammable base in case coals spill out. Install the unit a safe distance from flammable walls and other materials.

When you leave your home, the fire should be small, and the air intake should be closed; better still if you plan to be away for the day don't start the fire at all. Provide for ventilation so that oxygen used by the fire can be replaced. Don' use volatile liquids such as charcoal lighter or kerosene to start fires. Avoid burning items like paper and cardboard which can produce high flames that may cause flue fires. Don't burn chemical items such as plastics and chemically treated wood, or wood carrying poison ivy since many people are sensitive to small amounts of smoke from these materials.

Should you have a chimney fire, call the fire department. Close all openings and draft controls on the stove. If the fire is burning vigorously in the chimney, throw in baking soda or discharge a fire extinguisher into the stove; the chemical will travel up the chimney and often extinguish the flame. Spraying water onto your roof may prevent fire from spreading to your home, but avoid wetting the chimney since quick cooling may damage flues and masonry.

Wood fires have kept humans warm since long before recorded history. Hearths are often the first things found by archeologists at ancient sites. Isn't it ironic that in many homes today you will find computers that link people and information around the world, and in the next room a wood fire that has changed little in centuries. Some things really don't change much.